

AAGCTCAGAT CTACCTGCCT GAGGGCGTCC GGTTCAGCT GGCCCTTCCC GAGGGGGAGA																60
GGGAGGCGTT TCTAAAAGCC CTTCAGGACG CTACCCGGGG GCGGGTGGTG GAAGGGTAAC																120
ATG Met 1	AGG Arg	GGG Gly	ATG Met	CTG Leu 5	CCC Pro	CTC Leu	TTT Phe	GAG Glu	CCC Pro 10	AAG Lys	GGC Gly	CGG Arg	GTC Val	CTC Leu 15	CTG Leu	168
GTG Val	GAC Asp	GGC Gly	CAC His 20	CAC His	CTG Leu	GCC Ala	TAC Tyr	CGC Arg 25	ACC Thr	TTC Phe	CAC His	GCC Ala	CTG Leu 30	AAG Lys	GGC Gly	216
CTC Leu	ACC Thr	ACC Thr 35	AGC Ser	CGG Arg	GGG Gly	GAG Glu	CCG Pro 40	GTG Val	CAG Gln	GCG Ala	GTC Val	TAC Tyr 45	GGC Gly	TTC Phe	GCC Ala	264
AAG Lys	AGC Ser 50	CTC Leu	CTC Leu	AAG Lys	GCC Ala	CTC Leu 55	AAG Lys	GAG Glu	GAC Asp	GGG Gly	GAC Asp 60	GCG Ala	GTG Val	ATC Ile	GTG Val	312
GTC Val 65	TTT Phe	GAC Asp	GCC Ala	AAG Lys	GCC Ala 70	CCC Pro	TCC Ser	TTC Phe	CGC Arg	CAC His 75	GAG Glu	GCC Ala	TAC Tyr	GGG Gly	GGG Gly 80	360
TAC Tyr	AAG Lys	GCG Ala	GGC Gly	CGG Arg 85	GCC Ala	CCC Pro	ACG Thr	CCG Pro	GAG Glu 90	GAC Asp	TTT Phe	CCC Pro	CGG Arg	CAA Gln 95	CTC Leu	408
GCC Ala	CTC Leu	ATC Ile	AAG Lys 100	GAG Glu	CTG Leu	GTG Val	GAC Asp	CTC Leu 105	CTG Leu	GGG Gly	CTG Leu	GCG Ala	CGC Arg 110	CTC Leu	GAG Glu	456
GTC Val	CCG Pro	GGC Gly 115	TAC Tyr	GAG Glu	GCG Ala	GAC Asp	GAC Asp 120	GTC Val	CTG Leu	GCC Ala	AGC Ser	CTG Leu 125	GCC Ala	AAG Lys	AAG Lys	504
GCG Ala	GAA Glu 130	AAG Lys	GAG Glu	GGC Gly	TAC Tyr	GAG Glu 135	GTC Val	CGC Arg	ATC Ile	CTC Leu	ACC Thr 140	GCC Ala	GAC Asp	AAA Lys	GAC Asp	552
CTT Leu 145	TAC Tyr	CAG Gln	CTC Leu	CTT Leu	TCC Ser 150	GAC Asp	CGC Arg	ATC Ile	CAC His	GTC Val 155	CTC Leu	CAC His	CCC Pro	GAG Glu	GGG Gly 160	600
TAC Tyr	CTC Leu	ATC Ile	ACC Thr	CCG Pro 165	GCC Ala	TGG Trp	CTT Leu	TGG Trp	GAA Glu 170	AAG Lys	TAC Tyr	GGC Gly	CTG Leu	AGG Arg 175	CCC Pro	648
GAC Asp	CAG Gln	TGG Trp	GCC Ala 180	GAC Asp	TAC Tyr	CGG Arg	GCC Ala	CTG Leu 185	ACC Thr	GGG Gly	GAC Asp	GAG Glu	TCC Ser 190	GAC Asp	AAC Asn	696
CTT Leu	CCC Pro	GGG Gly 195	GTC Val	AAG Lys	GGC Gly	ATC Ile	GGG Gly 200	GAG Glu	AAG Lys	ACG Thr	GCG Ala	AGG Arg 205	AAG Lys	CTT Leu	CTG Leu	744

FIG. 1A

GAG Glu 210	GAG Glu 210	TGG Trp	GGG Gly	AGC Ser	CTG Leu	GAA Glu 215	GCC Ala	CTC Leu	CTC Leu	AAG Lys	AAC Asn 220	CTG Leu	GAC Asp	CGG Arg	CTG Leu	792
AAG Lys 225	CCC Pro	GCC Ala	ATC Ile	CGG Arg	GAG Glu 230	AAG Lys	ATC Ile	CTG Leu	GCC Ala	CAC His 235	ATG Met	GAC Asp	GAT Asp	CTG Leu	AAG Lys 240	840
CTC Leu	TCC Ser	TGG Trp	GAC Asp	CTG Leu 245	GCC Ala	AAG Lys	GTG Val	CGC Arg	ACC Thr 250	GAC Asp	CTG Leu	CCC Pro	CTG Leu	GAG Glu 255	GTG Val	888
GAC Asp	TTC Phe	GCC Ala	AAA Lys 260	AGG Arg	CGG Arg	GAG Glu	CCC Pro	GAC Asp 265	CGG Arg	GAG Glu	AGG Arg	CTT Leu	AGG Arg 270	GCC Ala	TTT Phe	936
CTG Leu	GAG Glu	AGG Arg 275	CTT Leu	GAG Glu	TTT Phe	GGC Gly	AGC Ser 280	CTC Leu	CTC Leu	CAC His	GAG Glu	TTC Phe 285	GGC Glu	CTT Leu	CTG Leu	984
GAA Glu	AGC Ser 290	CCC Pro	AAG Lys	GCC Ala	CTG Leu	GAG Glu 295	GAG Glu	GCC Ala	CCC Pro	TGG Trp	CCC Pro 300	CCG Pro	CCG Pro	GAA Glu	GGG Gly	1032
GCC Ala 305	TTC Phe	GTG Val	GGC Gly	TTT Phe	GTG Val 310	CTT Leu	TCC Ser	CGC Arg	AAG Lys	GAG Glu 315	CCC Pro	ATG Met	TGG Trp	GCC Ala	GAT Asp 320	1080
CTT Leu	CTG Leu	GCC Ala	CTG Leu	GCC Ala 325	GCC Ala	GCC Ala	AGG Arg	GGG Gly	GGC Gly 330	CGG Arg	GTC Val	CAC His	CGG Arg	GCC Ala 335	CCC Pro	1128
GAG Glu	CCT Pro	TAT Tyr	AAA Lys 340	GCC Ala	CTC Leu	AGG Arg	GAC Asp	CTG Leu 345	AAG Lys	GAG Glu	GCG Ala	CGG Arg	GGG Gly 350	CTT Leu	CTC Leu	1176
GCC Ala	AAA Lys 355	GAC Asp	CTG Leu	AGC Ser	GTT Val	CTG Leu	GCC Ala 360	CTG Leu	AGG Arg	GAA Glu	GGC Gly 365	CTT Leu 365	GGC Gly	CTC Leu	CCG Pro	1224
CCC Pro	GGC Gly 370	GAC Asp	GAC Asp	CCC Pro	ATG Met	CTC Leu 375	CTC Leu	GCC Ala	TAC Tyr	CTC Leu	CTG Leu 380	GAC Asp	CCT Pro	TCC Ser	AAC Asn	1272
ACC Thr 385	ACC Thr	CCC Pro	GAG Glu	GGG Gly	GTG Val 390	GCC Ala	CGG Arg	CGC Arg	TAC Tyr	GGC Gly 395	GGG Gly	GAG Glu	TGG Trp	ACG Thr	GAG Glu 400	1320
GAG Glu	GCG Ala	GGG Gly	GAG Glu	CGG Arg 405	GCC Ala	GCC Ala	CTT Leu	TCC Ser	GAG Glu 410	AGG Arg	CTC Leu	TTC Phe	GCC Ala	AAC Asn 415	CTG Leu	1368
TGG Trp	GGG Gly	AGG Arg	CTT Leu 420	GAG Glu	GGG Gly	GAG Glu	GAG Glu	AGG Arg 425	CTC Leu	CTT Leu	TGG Trp	CTT Leu	TAC Tyr 430	CGG Arg	GAG Glu	1416

FIG. 1B

GTG Val	GAG Glu	AGG Arg 435	CCC Pro	CTT Leu	TCC Ser	GCT Ala	GTC Val 440	CTG Leu	GCC Ala	CAC His	ATG Met	GAG Glu 445	GCC Ala	ACG Thr	GGG Gly	1464
GTG Val	CGC Arg 450	CTG Leu	GAC Asp	GTG Val	GCC Ala	TAT Tyr 455	CTC Leu	AGG Arg	GCC Ala	TTG Leu	TCC Ser 460	CTG Leu	GAG Glu	GTG Val	GCC Ala	1512
GAG Glu 465	GAG Glu	ATC Ile	GCC Ala	CGC Arg	CTC Leu 470	GAG Glu	GCC Ala	GAG Glu	GTC Val	TTC Phe 475	CGC Arg	CTG Leu	GCC Ala	GGC Gly	CAC His 480	1560
CCC Pro	TTC Phe	AAC Asn	CTC Leu	AAC Asn 485	TCC Ser	CGG Arg	GAC Asp	CAG Gln	CTG Leu 490	GAA Glu	AGG Arg	GTC Val	CTC Leu	TTT Phe 495	GAC Asp	1608
GAG Glu	CTA Leu	GGG Gly	CTT Leu 500	CCC Pro	GCC Ala	ATC Ile	GGC Gly	AAG Lys 505	ACG Thr	GAG Glu	AAG Lys	ACC Thr	GGC Gly 510	AAG Lys	CGC Arg	1656
TCC Ser	ACC Thr	AGC Ser 515	GCC Ala	GCC Ala	GTC Val	CTG Leu	GAG Glu 520	GCC Ala	CTC Leu	CGC Arg	GAG Glu	GCC Ala 525	CAC His	CCC Pro	ATC Ile	1704
GTG Val	GAG Glu 530	AAG Lys	ATC Ile	CTG Leu	CAG Gln	TAC Tyr 535	CGG Arg	GAG Glu	CTC Leu	ACC Thr	AAG Lys 540	CTG Leu	AAG Lys	AGC Ser	ACC Thr	1752
TAC Tyr 545	ATT Ile	GAC Asp	CCC Pro	TTG Leu	CCG Pro 550	GAC Asp	CTC Leu	ATC Ile	CAC His	CCC Pro 555	AGG Arg	ACG Thr	GGC Gly	CGC Arg	CTC Leu 560	1800
CAC His	ACC Thr	CGC Arg	TTC Phe	AAC Asn 565	CAG Gln	ACG Thr	GCC Ala	ACG Thr	GCC Ala 570	ACG Thr	GGC Gly	AGG Arg	CTA Leu	AGT Ser 575	AGC Ser	1848
TCC Ser	GAT Asp	CCC Pro	AAC Asn 580	CTC Leu	CAG Gln	AAC Asn	ATC Ile	CCC Pro 585	GTC Val	CGC Arg	ACC Thr	CCG Pro	CTT Leu 590	GGG Gly	CAG Gln	1896
AGG Arg	ATC Ile	CGC Arg 595	CGG Arg	GCC Ala	TTC Phe	ATC Ile	GCC Ala 600	GAG Glu	GAG Glu	GGG Gly	TGG Trp	CTA Leu 605	TTG Leu	GTG Val	GCC Ala	1944
CTG Leu	GAC Asp 610	TAT Tyr	AGC Ser	CAG Gln	ATA Ile	GAG Glu 615	CTC Leu	AGG Arg	GTG Val	CTG Leu	GCC Ala 620	CAC His	CTC Leu	TCC Ser	GGC Gly	1992
GAC Asp 625	GAG Glu	AAC Asn	CTG Leu	ATC Ile	CGG Arg 630	GTC Val	TTC Phe	CAG Gln	GAG Glu	GGG Gly 635	CGG Arg	GAC Asp	ATC Ile	CAC His	ACG Thr 640	2040
GAG Glu	ACC Thr	GCC Ala	AGC Ser	TGG Trp 645	ATG Met	TTC Phe	GGC Gly	GTC Val	CCC Pro 650	CGG Arg	GAG Glu	GCC Ala	GTG Val	GAC Asp 655	CCC Pro	2088

FIG. 1C

CTG	ATG	CGC	CGG	GCG	GCC	AAG	ACC	ATC	AAC	TTC	GGG	GTC	CTC	TAC	GGC	2136
Leu	Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	
			660					665					670			
ATG	TCG	GCC	CAC	CGC	CTC	TCC	CAG	GAG	CTA	GCC	ATC	CCT	TAC	GAG	GAG	2184
Met	Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	
		675					680					685				
GCC	CAG	GCC	TTC	ATT	GAG	CGC	TAC	TTT	CAG	AGC	TTC	CCC	AAG	GTG	CGG	2232
Ala	Gln	Ala	Phe	Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	
	690					695					700					
GCC	TGG	ATT	GAG	AAG	ACC	CTG	GAG	GAG	GGC	AGG	AGG	CGG	GGG	TAC	GTG	2280
Ala	Trp	Ile	Glu	Lys	Thr	Leu	Glu	Glu	Gly	Arg	Arg	Arg	Gly	Tyr	Val	
705					710				715						720	
GAG	ACC	CTC	TTC	GGC	CGC	CGC	CGC	TAC	GTG	CCA	GAC	CTA	GAG	GCC	CGG	2328
Glu	Thr	Leu	Phe	Gly	Arg	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg	
				725					730					735		
GTG	AAG	AGC	GTG	CGG	GAG	GCG	GCC	GAG	CGC	ATG	GCC	TTC	AAC	ATG	CCC	2376
Val	Lys	Ser	Val	Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Phe	Asn	Met	Pro	
			740					745					750			
GTC	CAG	GGC	ACC	GCC	GCC	GAC	CTC	ATG	AAG	CTG	GCT	ATG	GTG	AAG	CTC	2424
Val	Gln	Gly	Thr	Ala	Ala	Asp	Leu	Met	Lys	Leu	Ala	Met	Val	Lys	Leu	
		755					760					765				
TTC	CCC	AGG	CTG	GAG	GAA	ATG	GGG	GCC	AGG	ATG	CTC	CTT	CAG	GTC	CAC	2472
Phe	Pro	Arg	Leu	Glu	Glu	Met	Gly	Ala	Arg	Met	Leu	Leu	Gln	Val	His	
	770					775					780					
GAC	GAG	CTG	GTC	CTC	GAG	GCC	CCA	AAA	GAG	AGG	GCG	GAG	GCC	GTG	GCC	2520
Asp	Glu	Leu	Val	Leu	Glu	Ala	Pro	Lys	Glu	Arg	Ala	Glu	Ala	Val	Ala	
785					790				795						800	
CGG	CTG	GCC	AAG	GAG	GTC	ATG	GAG	GGG	GTG	TAT	CCC	CTG	GCC	GTG	CCC	2568
Arg	Leu	Ala	Lys	Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Pro	
				805					810					815		
CTG	GAG	GTG	GAG	GTG	GGG	ATA	GGG	GAG	GAC	TGG	CTC	TCC	GCC	AAG	GAG	2616
Leu	Glu	Val	Glu	Val	Gly	Ile	Gly	Glu	Asp	Trp	Leu	Ser	Ala	Lys	Glu	
			820					825					830			
TGATACCACC																2626

FIG. 1D

Taq	659				663				667			671	
E.coli	754				758				762			766	
WT :	R	R	A	A	K	T	I	N	F	G	V	L	Y
			S	S		S	V	I			I	I	F
			E			N	T	D				T	
			P			I	L	V				V	
			G			P							
			K			R							
			R			H							

FIG. 2A

Taq	659	660		663				667	668				
E.coli	754	755		758				762	763				
WT :	R	R	A	A	K	T	I	N	F	G	V	L	Y
		Y							Y	S			
		P								Q			
		G								R			
		S								K			
		I											
		K											
		W											
		C											
		A											

FIG. 2C

Taq E.coli	659 754				663 758				667 762				671 766
WT :	R	R	A	A	K	T	I	N	F	G	V	L	Y
24 :						P					I	F	
36 :			S	S		S	V						
42 :			E			A							
65 :			R			S							
73 :			T			R							
75 :			P			L							
109 :													
117 :													
122 :											I		
123 :				S							T		
126 :													
129 :			R										F
130 :	P											T	
149 :						I		D					
151 :						R		I					
152 :						S							F
169 :			S								L		
175 :	W					K							
184 :	W							I				T	
213 :						P							
228 :						S	T						
240 :				G		N							
247 :			G					I					
252 :						S	S						
272 :			E			I							
280 :			P					I					
306 :						N						I	
307 :						R	T						F
308 :			P			P	V				L		
44 :			T				T						
54 :			E				T						
74 :			G						L		I		
110 :						P		Y					
219 :						S							
250 :	Q		P			S		I	I			V	
30 :			S	G									
156 :													

FIG. 2B

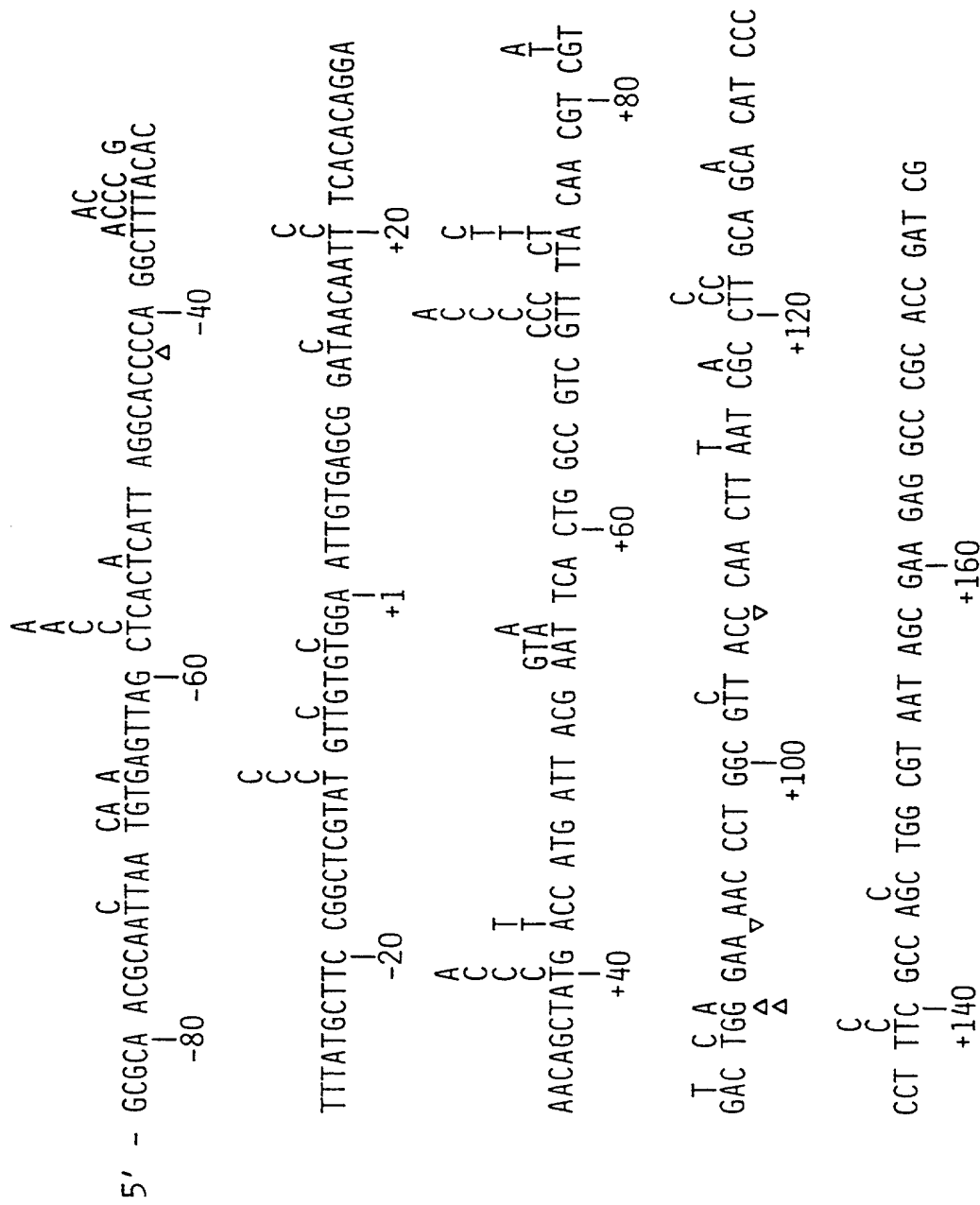


FIG. 3